

TORSIONAL OSCILLATIONS WITHIN THE EARTH'S CORE

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Torsional oscillation in the axial angular momentum of the Earth's liquid core are investigated by dividing the core into twenty idealized equi-volume annuli coaxial with the axis of rotation of the Earth. The temporal variations in the axial angular momentum component of each annuli are determined from the core-mantle boundary (CMB) velocity field under the assumption of rigid rotation of each annuli. With the available velocity fields at the CMB as derived from geomagnetic variation observation, the general characteristics of axial core angular momentum (CAM) are explored over 15 decades (1840 — 1990) extending an on-going study (see Hide et al., *GJI*, 2000). Five modes (with a mode being defined as a global oscillation with common variability among the 20 annuli) are isolated and are studied separately. The first two modes roughly correspond to the modes identified by Zatman and Bloxham (*Nature*, 1997). Propagation of CAM anomalies from the CMB to the inner core — outer core boundary is evident in these modes; the implications of these results will be discussed.